

REMARKS/ARGUMENTS

Claims 1, 3, 4, 5 and 7 to 12 are currently pending.

Claim 1 is amended so that the phrase “electrolytic ions of iron or the like” now reads “electrolytic ions of iron, manganese, calcium, sodium, or magnesium”. The basis for this amendment is provided by page 8, paragraph 3 and page 9, paragraph 2 which refer to “electrolytes such as ions of iron, manganese, calcium, sodium, magnesium and ions of other minerals”, and by the similar list of elements on page 10, paragraph 5. It is clear, from the original phrase “iron or the like” that the electrolytic ions may be of any of the elements in those lists.

Also in claim 1, the phrase “each ozone nano-bubble” now reads “each of the ozone nano-bubbles” and the phrase “diffusing through the aqueous solution” now reads “dissipating”. The basis for the term “dissipating” is provided by the references to dissipation on page 7, paragraph 1 and 2 and page 8, paragraph 2. In addition, in the discussion of prior art on page 2, paragraph 1 of the description, it is noted that ozone dissolved in an aqueous solution may dissipate “by diffusion from the surface of the aqueous solution”.

Claim 1 is further amended to remove “wherein the ozone nano-bubbles with the mean diameter of about 140nm (with a standard deviation of about 30nm) are found to be stable in water after one week when the ozone water is placed in a glass bottle, and stored in a cool, dark place with the bottle being covered with a lid, and wherein the ozone concentration in the water has 1.0 mg/L or more in six months as the original ozone concentration has been about 1.5mg/L”. The deleted features were not specified in claim 1 as originally filed and their deletion does not add new subject matter.

Claim 3 is amended so that “the step of instantaneously shrinking bubble

diameters of ozone-containing microbubbles” is replaced with “instantaneously shrinking ozone-containing microbubbles” for consistency with terminology used in the dependent claims.

Claim 3 is amended so that the phrase “iron or the like” now reads “iron, manganese, calcium, sodium, or magnesium”. The basis for this amendment was noted above in relation to claim 1.

The limitation “wherein the ozone concentration in the water has 1.0 mg/L or more in six months as the original ozone concentration has been about 1.5mg/L” is removed from claim 3. This feature was not included in claim 3 as originally filed and so its deletion does not result in new subject matter.

Other minor amendments are made to the wording of claim 3. The phrase “with diameter of 10 to 50 μm ” now reads “with diameters of 10 to 50 μm ”, while “so that the electrical conductivity of the aqueous solution reaching 300 $\mu\text{S}/\text{cm}$ or more” now reads “so that the electrical conductivity of the aqueous solution reaches more than 300 $\mu\text{S}/\text{cm}$ ”. The parentheses around the phrase “with a standard deviation of about 30nm” are removed.

Minor revisions are made to claim 4, to refer to the “diameter of the microbubbles” instead of “bubble diameter” and to replace the phrase “200 nm or less” with “less than 200 nm”.

Claim 5 is amended to remove the reference to negatively charged electrolyte ions being electrostatically attracted to ions of H^+ . It is noted that the deleted feature was not specified in claim 5 as originally filed.

Claim 7 is canceled without prejudice.

Claim Rejections under 35 USC §112

The Examiner rejected claims 1, 3 to 5 and 7 to 12 as failing to comply with the written description requirement. The features highlighted by the Examiner have been removed from claims 1 and 5 and claim 7 has been canceled, rendering the rejection moot.

Claims 1, 3 to 5 and 7 to 12 were also rejected for being indefinite. These rejections have been addressed as follows:

- In claims 1 and 3, the limitations relating to original ozone concentration and concentration of ozone after storage have been deleted;
- Amended claim 5 now refers only to “positively charged ones of the electrolytic ions” being “electrostatically attracted to ions of OH⁻”;
- The phrase “iron or the like” in claims 1 and 3 has been replaced with a list of elements; and
- Claim 7 has been canceled.

It is requested that the Examiner reconsiders the rejection of claim 4 for indefiniteness. It is submitted that the limitation that the microbubbles have diameters of “less than 200 nm” in claim 4 is not inconsistent with the limitation that the mean diameter of the microbubbles is about 140nm with a standard deviation of about 30 nm” in preceding claim 3. This is because a distribution of diameters having a mean of 140 nm and a standard deviation of about 30 nm would necessarily include diameters that are greater than the mean.

The Examiner also rejected claims 1, 3 to 5 and 7 to 12 for failing to set for the subject matter which the applicants regards as their invention, citing the response filed on 1/31/2011. It is noted that claims 1 and 3 specify “electrolytic ions of iron, manganese, calcium, sodium or magnesium”. Such electrolyte ions are positively charged. In the passage of the previous response highlighted by the Examiner, it was noted that “the charged surface of the microbubble attracts

the counter ions including the electrolyte ions such as Na^+ and Mn^{2+} (emphasis added). It is clear from that statement that Na^+ and Mn^{2+} are examples of electrolyte ions that are attracted to the microbubble surface. It is clear from that statement that the electrolyte ions may be ions other than Na^+ and Mn^{2+} . This is consistent with the description. For example, page 8, paragraph 3 and page 9, paragraph 2 both refer to “electrolytes such as ions of iron, manganese, calcium, sodium, magnesium and ions of other minerals”, while page 10, paragraph 5 refers to “electrolytes such as iron, manganese, calcium and other minerals”. Therefore, it is respectfully requested that the Examiner reconsiders this rejection.

Withdrawal of the rejections and allowance of the claims are respectfully requested.

The Commissioner is authorized to charge any additional fees which may be required or credit overpayment to deposit account no. 12-0415. In particular, if this response is not timely filed, then the Commissioner is authorized to treat this response as including a petition to extend the time period pursuant to 37 CFR 1.136 (a) requesting an extension of time of the number of months necessary to make this response timely filed and the petition fee due in connection therewith may be charged to deposit account no. 12-0415.

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Very truly yours,

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